

**IN THE CLAIMS**

The following is a complete listing of the claims, which replaces all previous versions and listings of the claims.

1. (previously presented) A method for imaging an organ, comprising the steps of:  
    acquiring a set of motion data for two or more organs from at least one of one or more types of electrical sensors or one or more types of non-electrical sensors;  
    processing the set of motion data to extract two or more prospective gating points for an organ of interest; and  
    acquiring a set of image data representative of the organ of interest using the two or more prospective gating points.
2. (original) The method, as recited in claim 1, further comprising the steps of:  
    reconstructing the set of image data to generate a set of reconstructed data; and  
    generating an image from the set of reconstructed data.
3. (previously presented) The method, as recited in claim 2, wherein generating the image comprises fusing a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.
4. (previously presented) The method, as recited in claim 1, wherein at least one of the electrical sensors or the non-electrical sensors are activated in accordance with a set of positional data acquired by one or more positional sensors.
5. (original) The method, as recited in claim 1, wherein each type of electrical sensor comprises two or more electrical sensors of the type.

6. (original) The method, as recited in claim 1, wherein each type of non-electrical sensor comprises one or more non-electrical sensors of the type.
7. (original) The method, as recited in claim 1, wherein the set of motion data is at least partially acquired from a set of pre-acquisition image data.
8. (original) A method, for imaging an organ, comprising the steps of:
  - acquiring a set of motion data for one or more organs from at least two of one or more types of electrical sensors and one or more types of non-electrical sensors;
  - processing the set of motion data to extract two or more prospective gating points for an organ of interest; and
  - acquiring a set of image data representative of the organ of interest using the two or more prospective gating points.
9. (original) The method, as recited in claim 8, further comprising the steps of:
  - reconstructing the set of image data to generate a set of reconstructed data; and
  - generating an image from the set of reconstructed data.
10. (previously presented) The method, as recited in claim 9, wherein generating the image comprises fusing a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.
11. (previously presented) The method, as recited in claim 8, wherein at least one of the electrical sensors or the non-electrical sensors are activated in accordance with a set of positional data acquired by one or more positional sensors.
12. (original) The method, as recited in claim 8, wherein each type of electrical sensor comprises two or more electrical sensors of the type.

13. (original) The method, as recited in claim 8, wherein each type of non-electrical sensor comprises one or more non-electrical sensors of the type.

14. (original) The method, as recited in claim 8, wherein the set of motion data is at least partially acquired from a set of pre-acquisition image data.

15. (previously presented) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

- a routine for acquiring a set of motion data for two or more organs from at least one of one or more types of electrical sensors or one or more types of non-electrical sensors;

- a routine for processing the set of motion data to extract two or more prospective gating points for an organ of interest; and

- a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points.

16. (original) The computer program, as recited in claim 15, further comprising:

- a routine for reconstructing the set of image data to generate a set of reconstructed data; and

- a routine for generating an image from the set of reconstructed data.

17. (previously presented) The computer program, as recited in claim 16, wherein the routine for generating the image fuses a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.

18. (previously presented) The computer program, as recited in claim 15, wherein the routine for acquiring the set of motion data activates at least one of the electrical sensors or the non-electrical sensors in accordance with a set of positional data acquired by one or more positional sensors.

19. (original) The computer program, as recited in claim 15, wherein the routine for acquiring the set of motion data acquires at least part of the set of motion data from a set of pre-acquisition image data.

20. (previously presented) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

- a routine for acquiring a set of motion data for one or more organs from at least two of one or more types of electrical sensors and one or more types of non-electrical sensors;

- a routine for processing the set of motion data to extract two or more prospective gating points for an organ of interest; and

- a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points.

21. (original) The computer program as recited in claim 20, further comprising:

- a routine for reconstructing the set of image data to generate a set of reconstructed data; and

- a routine for generating an image from the set of reconstructed data.

22. (previously presented) The computer program as recited in claim 21, wherein the routine for generating the image fuses a set of image data representative of structure with at least one of a set of image data representative of motion or a set of image data representative of electrical activity.

23. (previously presented) The computer program as recited in claim 20, wherein the routine for acquiring the set of motion data activates at least one of the electrical sensors or the non-electrical sensors in accordance with a set of positional data acquired by one or more positional sensors.

24. (original) The computer program, as recited in claim 20, wherein the routine for acquiring the set of motion data acquires at least part of the set of motion data from a set of pre-acquisition image data.

25. (previously presented) An imaging system comprising:

- an imager configured to generate a plurality of signals representative of a region of interest;

- data acquisition circuitry configured to acquire the plurality of signals;

- data processing circuitry configured to process the plurality of signals;

- system control circuitry configured to operate at least one of the imager and the data acquisition circuitry;

- an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;

and

- a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of two or more organs within the region of interest.

26. (original) The imaging system as recited in claim 25, further comprising one or more positional sensors configured to activate one or more non-electrical sensors for the sensor-based motion measurement system based on the position of the one or more non-electrical sensors relative to the imager.

27. (original) The imaging system as recited in claim 25, further comprising one or more positional sensors configured to activate two or more electrical sensors for the sensor-based motion measurement system based on the position of the two or more electrical sensors relative to the imager.

28. (original) The imaging system as recited in claim 25, wherein the sensor-based motion measurement system is configured to measure electrical activity indicative of the motion of two or more organs via two or more electrical sensors.

29. (original) The imaging system as recited in claim 25, wherein the sensor-based motion measurement system is configured to measure non-electrical activity indicative of the motion of two or more organs via one or more non-electrical sensors.

30. (original) The imaging system as recited in claim 29, wherein the one or more non-electrical sensors comprise accelerometers, optical markers, displacement sensors, force sensors, ultrasonic sensors, strain gauges, photodiodes, and pressure sensors.

31. (previously presented) An imaging system comprising:

- an imager configured to generate a plurality of signals representative of a region of interest;

- data acquisition circuitry configured to acquire the plurality of signals;

- data processing circuitry configured to process the plurality of signals;

- system control circuitry configured to operate at least one of the imager and the data acquisition circuitry;

- an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;
- and

- two or more sensor-based motion measurement systems, wherein each sensor-based motion measurement system is configured to measure electrical or non-electrical activity indicative of the motion of two or more organs within the region of interest.

32. (original) The imaging system as recited in claim 31, further comprising one or more positional sensors configured to activate one or more non-electrical sensors of a non-electrical sensor-based motion measurement system based on the position of the one or more non-electrical sensors relative to the imager.

33. (original) The imaging system as recited in claim 31, further comprising one or more positional sensors configured to activate two or more electrical sensors of an electrical sensor-based motion measurement system based on the position of the two or more electrical sensors relative to the imager.

34. (original) The imaging system as recited in claim 31, wherein at least one sensor-based motion measurement system is configured to measure electrical activity indicative of the motion of two or more organs via two or more electrical sensors.

35. (original) The imaging system as recited in claim 31, wherein at least one sensor-based motion measurement system is configured to measure non-electrical activity indicative of the motion of two or more organs via one or more non-electrical sensors.

36. (original) The imaging system as recited in claim 35, wherein the one or more non-electrical sensors comprise accelerometers, optical markers, displacement sensors, force sensors, ultrasonic sensors, strain gauges, photodiodes, and pressure sensors.

37. (previously presented) An imaging system, comprising:

- means for acquiring a set of motion data for two or more organs from at least one of one or more types of electrical sensors or one or more types of non-electrical sensors;

- means for processing the set of motion data to extract two or more prospective gating points for an organ of interest; and

- means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points.

38. (previously presented) An imaging system, comprising:

- means for acquiring a set of motion data for one or more organs from at least two of one or more types of electrical sensors or one or more types of non-electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points for an organ of interest; and  
means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points.

39. (previously presented) An imaging system comprising:

- an imager configured to generate a plurality of signals representative of a region of interest;
- data acquisition circuitry configured to acquire the plurality of signals;
- data processing circuitry configured to process the plurality of signals;
- system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from a set of motion data describing the motion of two or more organs within the region of interest;
- an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;
- and
- a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of at least one of the two or more organs within the region of interest to contribute to the set of motion data.

40. (previously presented) An imaging system comprising:

- an imager configured to generate a plurality of signals representative of a region of interest;
- data acquisition circuitry configured to acquire the plurality of signals;
- data processing circuitry configured to process the plurality of signals;
- system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from a set of motion data describing the motion of at least one organ within the region of interest;



an operator workstation configured to communicate with the system control circuitry and to receive the processed plurality of signals from the data processing circuitry;  
and

a sensor-based motion measurement system configured to contribute to the set of motion data by measuring electrical or non-electrical activity indicative of the motion of the at least one organ within the region of interest via at least two of one or more types of electrical sensors or one or more types of non-electrical sensors.